



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

h.p.

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,188	09/30/2003	Hironobu Sai	033022-010	1256
21839 7590 07/19/2007 BUCHANAN, INGERSOLL & ROONEY PC POST OFFICE BOX 1404 ALEXANDRIA, VA 22313-1404			EXAMINER LE, THAO X	
			ART UNIT 2814	PAPER NUMBER
			MAIL DATE 07/19/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/673,188

Applicant(s)

SAI ET AL.

Examiner

Thao X. Le

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,4 and 10-12 is/are pending in the application.
- 4a) Of the above claim(s) 5-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4 and 10-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 3-4 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6898215 to Naone et al. in view of US 6716378 to Yang et al. of record.

Regarding claim 1, Naone discloses a semiconductor light emitting device (LED) in fig. 1 and 7H-JA comprising: a mesa section (convex portion) having at least sandwich structure of an n-type clad layer 16, column 7 line 8, an active layer 18, column 5 line 46, and a p-type clad layer 20, column 5 line 47 and col. 6 line 43, which

Art Unit: 2814

are constituted by compound semiconductor layers formed on a substrate 12, column 5 line 41; an insulating film 454, fig. 7G, of polyimide, column 13 lines 43-48, to cover the mesa section excluding a contact region 428, fig. 7H col. 13 line 51; and an insulating layer 464, col. 13 line 53, cover the insulating layer 454, fig. 7H.

But, Naone does not disclose the LED wherein the inorganic insulating film having a porous area defined by cylindrical vacancies, having vacancy rate of 50% or more while being oriented substantially in parallel with a surface of the substrate, and wherein the vacancies are arranged at periodic interval.

However, Yang discloses the inorganic insulating film having a porous area defined by cylindrical vacancies, having vacancy rate of 50% or more, col. 6 lines 32-35, while being oriented substantially in parallel with a surface of the substrate, col. 6 line 30, and wherein the vacancies are arranged at periodic interval, fig. 2A-5C. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the inorganic layer teaching of Yang to replace the insulating layer 464 in Naone's device, because such insulating material would have produced a low dielectric constant, low-cost, non-toxic, and biodegradable inorganic dielectric material as taught by Yang in column 2 lines 38-40.

The 'vacancy' is being interpreted as a 'porosity' or 'holes' structure.

Regarding claim 3, Naone does not disclose the semiconductor light emitting device according to claim 2, wherein the inorganic insulating film comprises a plurality of

the porous structures, wherein the cylindrical are formed such that the cylindrical vacancies of adjacent porous structures are oriented in different directions.

However, Yang discloses a inorganic insulating film comprises a plurality of the porous structures, wherein the cylindrical are formed such that the cylindrical vacancies of adjacent porous structures are oriented in different directions, fig. 2A-5C col. 3 lines 8-20. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the inorganic layer teaching of Yang to replace the insulating layer 464 in Naone's device, because such insulating material would have produced a low dielectric constant and low-cost inorganic dielectric material as taught by Yang in column 2 lines 38-40.

Regarding claims 4 and 10-12, Naone discloses the semiconductor light emitting device according to any of claims to 3, wherein the mesa section includes a surface emission structure having an electrode 428 in a top portion and comprises a semiconductor layer 20, provided with an active layer 18 having a quantum well structure, column 2 line 30, constituted by a compound semiconductor, and a pad 500, fig. 7J, to come in contact with the electrode 428 is provided on the insulating film 464.

With respect to "a sintered inorganic", the process limitations "a sintered inorganic" do not carry weight in a claim drawn to structure. In re Thorpe, 277 USPQ 964 (Fed. Cir. 1985).

***Response to Arguments***

4. Applicant's arguments filed 06 June 2007 have been fully considered but they are not persuasive. The Applicant argues that Naone discloses layer 464 is an organic layer, not an inorganic layer as claimed, and Yang discloses the mesoporous metal oxide of the claimed invention but fails to disclose why the mesoporous material would be used in a LED device comprising a mesa section, an insulating film polyimide and an inorganic insulating film as claimed; therefore, the combination of Naone with Yang would not be possible. The Examiner respectfully submits that

- a. Polyimide is well known low dielectric material in the art
- b. The inorganic mesoporous of Yang is a low dielectric material, col, 6 line 36 c) and can be used in optoelectronic device, application related to the miniaturization of electronic devices, sensor arrays, or waveguides device, col. 6 lines 37 and 52 and col. 7 lines 20-22.
- c. Thus, replacing the polyimide material of Naone with the mesoporous material of Yang would have provided a functional equivalent material, i.e. low dielectric constant and achieved the advantages as discussed in the above claim 1. And such material substitution would not destroy the intended purpose of Naone's device. In addition, the applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

**Conclusion**

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

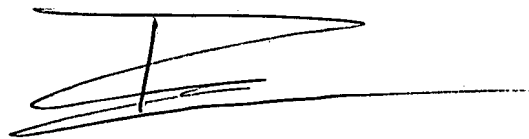
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

Art Unit: 2814

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

15 July 2007

A handwritten signature in black ink, consisting of a stylized 'T' followed by a horizontal line and a vertical stroke, with a long horizontal line extending to the right.

**THAO X. LE**  
**PRIMARY PATENT EXAMINER**